

(19) World Intellectual Property Organization
International Bureau

COPY

(43) International Publication Date
27 December 2002 (27.12.2002)

PCT

(10) International Publication Number
WO 02/103426 A3

(51) International Patent Classification: G02B 6/42

(21) International Application Number: PCT/US01/43264

(22) International Filing Date:
20 November 2001 (20.11.2001)

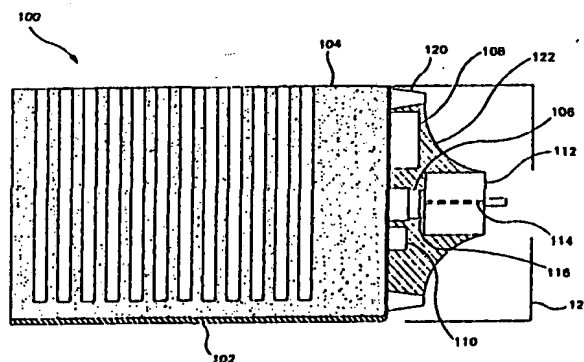
(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/749,286 26 December 2000 (26.12.2000) US(71) Applicant: EMCORE CORPORATION [US/US]; 145
Belmont Drive, Somerset, NJ 08873 (US).(72) Inventors: ANDERSON, Gene, R.; 10650 Oakland
Avenue, NE, Albuquerque, NM 87122 (US). ARMEN-
DARIZ, Marcelino, G.; 1023 Oro Real, NE, Albuquerque,
NM 87123 (US). BRYAN, Robert, P.; 4701 Winnetka
Court, NE, Albuquerque, NM 87111 (US). CARSON,
Richard, F.; 1036 Jewel Place, NE, Albuquerque, NM
87123 (US). DUCKETT, Edwin, B., III; 2220 Skybrook
Drive, NW, Albuquerque, NM 87120 (US). KEMME, Sh-
analyn, Adair; 14225 Nambe Avenue, NE, Albuquerque,NM 87123 (US). MCCORMICK, Frederick, B.; 12250
Mountain Haze Road, NE, Albuquerque, NM 87122 (US).
NEVERS, John, A.; 3904 General Bradley Street, NE,
Albuquerque, NM 87111 (US). PETERSON, David, W.;
395 Pinon Ridge, P.O. Box 267, Sandia Park, NM 87047
(US).(74) Agents: HEIT, Warren, S. et al.; White & Case LLP, 1155
Ave. of the Americas, New York, NY 10036 (US).(81) Designated States (*national*): AL, AG, AI, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GH, GI,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK,
SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.(84) Designated States (*regional*): ARIPO patent (GI, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR,
GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent
(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
NI, SN, TD, TG).

[Continued on next page]

(54) Title: OPTICAL POWER CONTROL SYSTEM



(57) Abstract: An optical power control system is provided that may be used in connection with an optical transmitter, receiver or transceiver module. The optical power control system comprises: (1) an array of optoelectronic devices; (2) an array of optical elements; (3) the array of optical elements optically aligned to the array of optoelectronic devices in such a manner that one or more optical elements is optically aligned to one or more optoelectronic devices; (4) a light receiving device; and (5) a reflector proximate to the array of optical elements, the reflector optically orientated with the array of optoelectronic devices and the light-receiving device such that some emission from at least one optoelectronic device is reflected on at least a portion of the light-receiving device. The optical elements may be optical fibers and may be packaged in a ferrule. The light-receiving device may be a photo-detector or a light pipe. A feedback loop connects the light-receiving device to the array of optoelectronic devices so as to adjust the output of the array of optoelectronic devices in response to the emission detected by the light-receiving device. The reflector scatters the emission from the optoelectronic device, and it may be adapted to a bottom surface of a ferrule. In another embodiment, optical resin is dispensed proximate to the array of optoelectronic devices and light-receiving device. Emission from at least one optoelectronic device is reflected onto the light-receiving device by the optical resin.

WO 02/103426 A3

Y900

WO 02/103426 A3



Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:

22 May 2003

(15) Information about Correction:

Previous Correction:

see PCT Gazette No. 14/2003 of 3 April 2003, Section II

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/43264

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G02B6/42

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 25641 A (KROPP JOERG REINHARDT ;SIEMENS AG (DE)) 17 July 1997 (1997-07-17) page 9, line 7 -page 10, line 15; figure 2	1-4,6-9, 11-19,21
Y		5,10, 51-61
X	WO 97 25638 A (KROPP JOERG REINHARDT ;STANGE HERWIG (DE); SIEMENS AG (DE)) 17 July 1997 (1997-07-17) page 12, line 28 -page 16, line 18; figures 1-6	1-9, 11-15, 19,21
Y		10,51-61
	--- -/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

24 March 2003

Date of mailing of the international search report

03/04/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Frisch, A

FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-21, 51-61

subject 1 relates to a laser array/optical element holder arrangement with a monitor diode for detecting the laser array output and a with a reflector incorporated into the optical element holder for directing (part) of the laser emission to the monitor diode

2. Claims: 22-50

subject 2 relates to a reflector for coupling the output of a monitor laser diode in a laser array arrangement to a receiving monitor diode

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/43264

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 790 678 A (ALSTHOM CGE ALCATEL) 20 August 1997 (1997-08-20) column 1, line 49 -column 3, line 2; figures 1,2	1,2,8,9, 11-15, 19,21
X	EP 0 974 856 A (HONEYWELL INC) 26 January 2000 (2000-01-26) column 11, line 32 -column 13, line 12; figures 9,10	1,2,8,9, 11-15, 20,21
X	WO 00 13051 A (DIGITAL OPTICS CORP ;FELDMAN MICHAEL R (US); JOHNSON ERIC G (US);) 9 March 2000 (2000-03-09) page 5, line 3 -page 6, line 4 page 11, line 15 -page 12, line 10; figure 6	1,2,7-9, 11-15,21
Y		51-61
Y	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 10, 31 August 1998 (1998-08-31) -& JP 10 126002 A (MATSUSHITA ELECTRON CORP), 15 May 1998 (1998-05-15) abstract; figures 5,6,10	5,10, 51-61
A	EP 0 899 592 A (BOSCH GMBH ROBERT) 3 March 1999 (1999-03-03) column 2, line 54 -column 3, line 58	6
Y	US 5 226 052 A (NAKATA NAOTARO ET AL) 6 July 1993 (1993-07-06) column 1, line 50 -column 2, line 32 column 3, line 1 -column 4, line 62	22-50
Y	EP 0 607 700 A (SHARP KK) 27 July 1994 (1994-07-27) column 1, line 18 -column 2, line 29 column 18, line 12 - line 51; figures 13,43,44	22-50
A	US 5 907 571 A (KOMATSU KEN ET AL) 25 May 1999 (1999-05-25) column 6, line 59 -column 7, line 41; figures 7,8	22-50

INTERNATIONAL SEARCH REPORT

international application No.
PCT/US 01/43264

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/43264

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9725641	A	17-07-1997	DE 19601955 A1	10-07-1997
			WO 9725641 A2	17-07-1997
			WO 9725638 A2	17-07-1997
			EP 0873534 A2	28-10-1998
			JP 2000502819 T	07-03-2000
			US 5997185 A	07-12-1999
WO 9725638	A	17-07-1997	DE 19601955 A1	10-07-1997
			DE 19650853 A1	10-07-1997
			WO 9725641 A2	17-07-1997
			WO 9725638 A2	17-07-1997
			EP 0873534 A2	28-10-1998
			JP 2000502819 T	07-03-2000
			US 5997185 A	07-12-1999
EP 0790678	A	20-08-1997	DE 19605726 A1	21-08-1997
			EP 0790678 A2	20-08-1997
			JP 9312407 A	02-12-1997
EP 0974856	A	26-01-2000	US 6081638 A	27-06-2000
			EP 0974856 A2	26-01-2000
WO 0013051	A	09-03-2000	AU 5789999 A	21-03-2000
			CA 2306845 A1	09-03-2000
			EP 1047970 A1	02-11-2000
			JP 2002523910 T	30-07-2002
			WO 0013051 A1	09-03-2000
			US 2002150341 A1	17-10-2002
			US 6314223 B1	06-11-2001
			US 6452669 B1	17-09-2002
			US 6404959 B1	11-06-2002
JP 10126002	A	15-05-1998	NONE	
EP 0899592	A	03-03-1999	EP 0899592 A1	03-03-1999
US 5226052	A	06-07-1993	JP 2547465 B2	23-10-1996
			JP 4014888 A	20-01-1992
			JP 2547466 B2	23-10-1996
			JP 4023381 A	27-01-1992
EP 0607700	A	27-07-1994	JP 3074092 B2	07-08-2000
			JP 6314847 A	08-11-1994
			JP 3084173 B2	04-09-2000
			JP 6334269 A	02-12-1994
			JP 3022059 B2	15-03-2000
			JP 6350131 A	22-12-1994
			JP 6196817 A	15-07-1994
			CA 2112343 A1	25-06-1994
			CN 1093837 A ,B	19-10-1994
			DE 69326136 D1	30-09-1999
			DE 69326136 T2	24-02-2000
			EP 0607700 A2	27-07-1994
			US 5557116 A	17-09-1996
US 5907571	A	25-05-1999	JP 3153149 B2	03-04-2001
			JP 10056238 A	24-02-1998